LETTERS TO THE EDITOR

Fig 1. Right renal artery fibromuscular dysplasia in a 26-year-old woman.

Regarding "Cutting balloon angioplasty of renal fibromuscular dysplasia: A word of caution"

We read with interest the article by Tanemoto et al (J Vasc Surg 2005;41:898-901) regarding cutting balloon angioplasty of resistant renal artery stenosis caused by fibromuscular dysplasia. Cutting balloon angioplasty is being increasingly used for tight stenosis as an alternative treatment to conventional angioplasty, particularly in coronaries and arteriovenous dialysis fistulas.[1] However, its use has been also described with successful results in other districts such as renal, popliteal, and supra-aortic vessels.[2,3]

The fact that the longitudinal blades mounted on the outer surface of the balloon are able to weaken the muscular layer of the media, thus reducing the elastic recoil of the vessel, is indubitably a great advantage in terms of technical result improvement and long-term patency. This holds true especially for those vessels in which the mechanism of restenosis is highly dependant on congenital pathologies of the media, such as fibromuscular dysplasia.

We agree with Tanemoto et al that, "because the high incidence of in-stent restenosis is high in cases with insufficient dilatation before stent placement a new therapeutic modality—such as cutting balloon angioplasty—to attain sufficient dilatation is required to obtain long term patency." Nevertheless, at our institute,

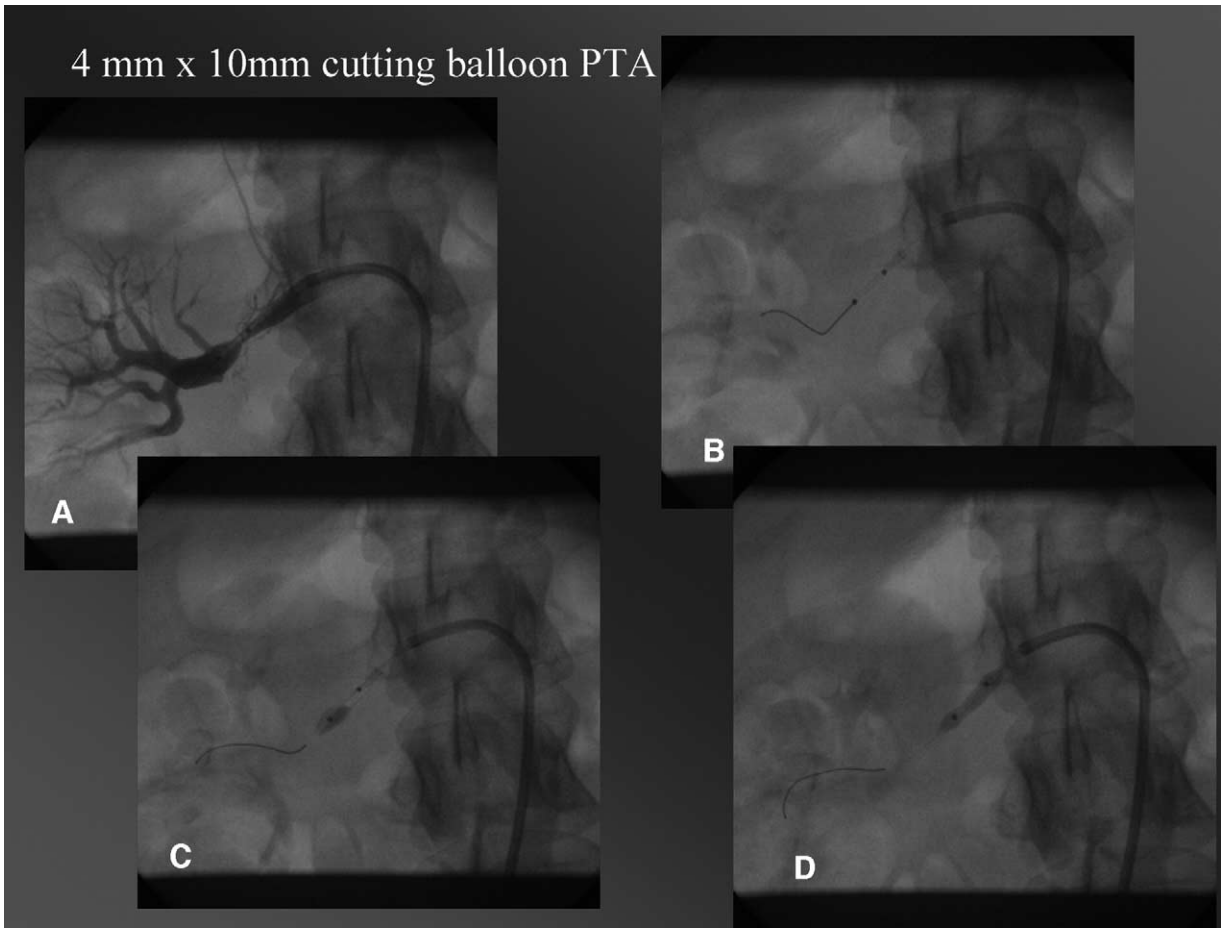

Fig 2. Percutaneous transluminal angioplasty performed with a 4-mm × 10-mm cutting balloon.

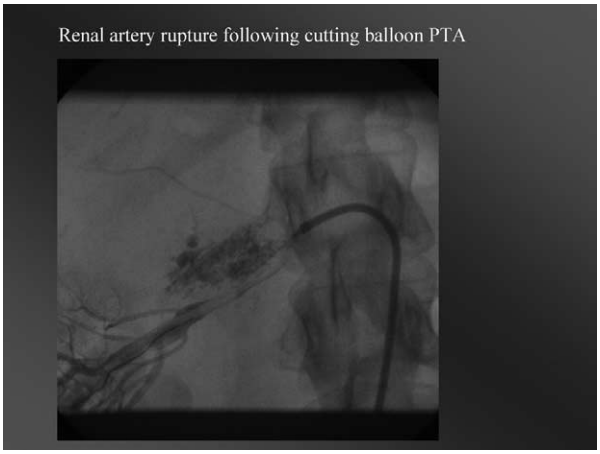

Fig 3. Confirmation angiogram shows renal artery rupture after cutting balloon percutaneous transluminal angioplasty.

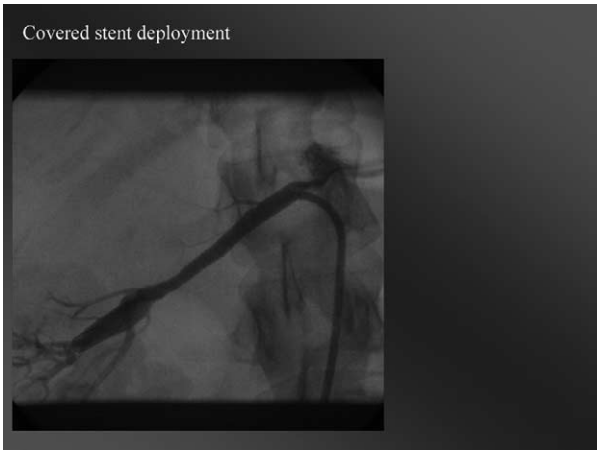

Fig 4. Ruptured renal artery repaired with two balloon-expandable covered stents.

we perform cutting balloon angioplasty in very selected cases and, most importantly, if a previous percutaneous transluminal angioplasty with an ordinary high-pressure balloon has proven ineffective as evidenced by residual stenosis >30% at confirmation angiogram.

At the moment, we do not use a cutting balloon below the common femoral artery or for atherosclerotic lesions of carotid arteries. Indeed, it is our policy to perform a cutting balloon angioplasty only when strictly necessary; moreover, in case of a history of repeat angioplasty at the same artery site, the choice of cutting balloon should be considered with great care. In such a scenario, the use of cutting balloon might be hazardous, even leading to a sudden rupture of the treated vessel.[4]

Just recently, we took the management of a 26-year-old woman with a thigh stenosis of the middle portion of the right renal artery due to an overlying fibromuscular dysplasia that had been already treated unsuccessfully twice with conventional angioplasty at a different hospital (Fig 1). Since repeat inflations of a 5 × 20 mm high pressure balloon proved unsatisfactory due to immediate elastic recoil of the artery, we decided to use a 4 × 10 cutting balloon (slightly inflated to 4 atmospheres) in an effort to reduce the vessel recoil and eventually improve the renal artery inner diameter (Fig 2, *A to D*).

Unfortunately, at the confirmation angiogram, a vessel rupture with subsequent massive extravasation of contrast medium outside the artery was seen (Fig 3) that required the immediate placement of two 5-mm × 12-mm balloon-expandable covered stents (Jostent, Jomed, Rangendingen, Germany). Although we were successful in re-establishing the vessel wall integrity and reopening the artery as well (with no evidence of residual stenosis) (Fig 4), the patient had a marked drop of hemoglobin that was managed with 2 units of blood. A computed tomography scan performed at the end of the procedure revealed a huge hematoma in the abdomen extending to the upper space of the pelvis. The patient recovered well and was discharged home on postoperative day 6.

In conclusion, although we agree with Tanemoto et al that the cutting balloon is an attractive tool for treating very resistant stenoses of renal arteries with fibromuscular dysplasia, its choice should be made with great care and, most of all, when previous conventional angioplasty has proven ineffective. Further cases are required to better understand the exact role of renal artery cutting balloon angioplasty in patients affected by fibromuscular dysplasia.

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Reply

I also think that cutting balloon angioplasty is a choice only for lesions that cannot be dilated by conventional angioplasty. Incisions by the blades of the cutting balloon potentially cause side effects, including dissection and perforation of arterial wall, as we have discussed previously. To prevent these side effects, we think that the following points should be considered for the use of a cutting balloon: (1) Cutting balloons relatively undersized to the arterial diameter should be used to make the initial incisions, followed by conventional balloon dilation. (2) Considering the rigidity of the blades of the cutting balloon, a sufficient length of the renal artery for the size of the balloon should be relatively straight around the lesion. (3) The balloon should not be moved during the inflation. Especially for point (3), movement of the kidney by respiration should be avoided during the inflation of balloon. We think that intravascular ultrasonography could be beneficial for cutting balloon angioplasty. By using intravascular ultrasonography, the fibrous stricture of the resistant stenosis and the irregular vascular wall thickness of fibromuscular dysplasia could be seen before the angioplasty.[1] The recognition of the